



Oregon

Kate Brown, Governor

February 25, 2019

Water Resources Department

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Eric Ball
Winchester Water Control District
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Re: Winchester Dam (W-1) – Inspection Summary

This dam was first inspected on October 3, 2018 then on October 23, 2018 and finally on October 25, 2018. I was on-site for all three inspections, accompanied at times by Civil Engineer Tony Janicek, Watermaster Susan Douthit and intern Arden Babb. After the initial inspection on October 3, we identified an area of leakage below the old powerhouse near the left abutment; the subsequent inspections were scheduled to observe the emergency repairs. We met with Juan Yraguen, a member of the Board and on site for urgent repair activities during our inspection on October 23. Most of these inspections were expedited to observe the leakage and repair work.

Results of Inspection:

Category	Inspected	Result
Access	<input checked="" type="checkbox"/>	Adequate
Reservoir	<input checked="" type="checkbox"/>	Repair
Spillway	<input checked="" type="checkbox"/>	Run of river
Gates	<input checked="" type="checkbox"/>	Adequate
Structure	<input type="checkbox"/>	Unable to Inspect
Seepage/Leakage	<input checked="" type="checkbox"/>	Deficient
Emergency Action Plan	<input checked="" type="checkbox"/>	Deficient

Details & Recommendations:

Access: Both sides of the dam are reasonably secure. Special and temporary access was developed with a gravel cofferdam around the area of leakage above the old powerhouse and gates.

Reservoir: The main issue for this inspection was a significant increase in leakage under the dam, near the gates. During our inspections work to identify and reduce the leakage was underway. The work appears to have successfully identified the source area of leakage as a number of spots from the left abutment, above the powerhouse, and possibly extending to the area above the gates. **It is important to continue to monitor this dam for leakage.**

Gates: The inspection did not evaluate the gates in detail. One gate was opened and functioned to release water, mostly through a temporary culvert pipe laid from the leak area through the gate.

Structure: We observed no new areas of significant distress in either overflow section, or in any of the exposed timbers. We did not examine timbers away from the work area, and have not inspected the steel rods that tie the structure to the rock foundation. **These will need to be inspected in detail in the next few years.**

Leakage: This was the focus of our inspections. Prior to the start of the repairs on 10/23, water could be seen draining underneath the north corner of the old powerhouse foundation and surfacing from underneath the dam downstream of the gate structure. After the repairs were mostly complete on 10/25 no evidence of leakage was observed on either side of the dam. We also observed sheet piles that had been driven a long time ago, apparently in an attempt to control past leakage. Several of the sheet piles were very uneven and did not form a reasonable seal. Our observations indicate river gravels under the powerhouse, and definitely is the foundation for part of the powerhouse. These gravels appear to be open and subject to leakage

Emergency Action Plan: We do have an EAP on file for this dam. It dates to 1987, and has no current contacts, means of detecting problems or notification procedures. **It needs to be updated, as it may no longer meets the statutory requirements.**

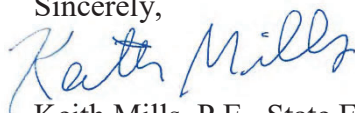
Summary: Due to other scheduled inspections during this time period we did not observe most of the construction activity. As of our final inspection, the repairs appear to have been effective in greatly reducing leakage and at least short term risk of failure by mechanism of undermining.

It is important to continue to monitor this dam for leakage and structural issues. The dam safety files are extensive, and resources have precluded full review of these files. The steel tie rods will need further engineering evaluation.

We use a standard inspection form, and a copy of the field inspection sheet for this dam is attached. We do appreciate the action taken to improve safety. On a run of the river dam like this it is very difficult, and it requires working in or near a very large river.

Please let me know if you have any questions about this inspection. We look forward to future inspections of this dam.

Sincerely,

A handwritten signature in blue ink that reads "Keith Mills". The signature is written in a cursive, flowing style.

Keith Mills, P.E., State Engineer for Water Resources
(503) 986-0840
Cell (541) 706-0849

C: Susan Douthit , Watermaster District 15
Dam Safety File W-1



Upwelling from leakage below dam – October 3, 2018



Excavation and flow control for repair – October 23, 2018



Exposed and ineffective old sheetpile – October 23



Flow through cofferdam directed under gate – October 23



Cofferdam – October 23, 2018



Site ready for concrete 10-23



Pouring concrete - afternoon of 10-23



Concrete filling upstream leaks on October 25, 2018